

### ABSTRACT

An improved etching process for creating dimensionally accurate sub-micron and micron via-openings is disclosed. Specifically, this invention discloses a via etching process for a polymer layer (24) deposited on a semiconductor substrate (28) comprising the steps of: placing the semiconductor substrate comprising a polymer layer (24) deposited on the semiconductor substrate, a hard-mask (30) deposited on the polymer layer (24) and a photoresist mask (32) deposited on the hard-mask (30). The invention further, discloses performing a hard-mask opening step (34) comprising releasing a first fluoride gas (36) into the chamber. Furthermore, performing a polymer etching step (40) comprising releasing a second fluoride gas (42) into the chamber is disclosed. The invention also includes a hard-mask removal and tapered via step (46) to increase process margin.